DOCUMENT RESUME

ED 278 006 CS 008 672

AUTHOR Bowman, Harry L.; And Others
TITLE Characteristics of U.S. Navy Recruits on Reading Comprehension and Educationally Related Variables: A Twelve-Month Profile from June, 1985 to May, 1986.
PUB DATE Nov 86
NOTE 28p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (15th, Memphis, TN, November 19-21, 1986).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Basic Skills; Data Analysis; *Military Personnel; *Reading Comprehension; Reading Improvement; *Reading Research; Remedial Programs; *Remedial Reading
IDENTIFIERS Armed Services Vocational Aptitude Battery; Gates MacGinitie Reading Tests

ABSTRACT

A study was conducted to investigate the reading comprehension and educationally related characteristics and relationships that describe the Navy's recruit population. The variable of primary interest was the recruit's reading comprehension grade level score; other variables were years of education, aptitude score, high school graduation status, and month of entry into the Navy. The study was conducted because the variability in the numbers of recruits who need reading remediation in language skills would have a direct effect on the requirements for staffing and instructional materials. More than 82,000 recruits (who entered the service between June 1985 and May 1986) took the Gates-MacGinitie Reading Comprehension Test and the Armed Services Vocational Aptitude Battery. Data analyses of their scores revealed that the typical Navy recruit completed slightly less than 12 years of education, with reading comprehension near the twelfth grade level. Findings suggest that the recruit population remains relatively stable, showing only slight variability with regard to years of education, reading comprehension skills, and aptitude scores. However, from month-to-month the recruits vary on reading, graduation status, and the number who read below grade six. (NKA)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

CHARACTERISTICS OF U.S. NAVY RECRUITS ON READING COMPREHENSION AND EDUCATIONALLY RELATED VARIABLES: A TWELVE-MONTH PROFILE FROM JUNE, 1985, TO MAY, 1986

ED278006

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Harry L. Bowman
College of Education
Memphis State University
Memphis, Tennessee 38152

Norman J. Kerr
SAIC Comsystems
McLean, Virginia 22102

Emily J. Webb
Chief of Naval Technical Traiaing
Naval Air Station Memphis
Millington, Tennessee 38054

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Harry L. Bowman

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Paper presented in a Symposium on "Fundamental Skills Remediation of U.S. Navy Enlisted Personnel: Selected Needs and Pilot Studies" at the Fifteenth Annual Meeting of the Mid-South Educational Research Association in Memphis, Tennessee; November 19-21, 1986

CS008672

BEST COPY AVAILABLE

Introduction

The Department of the Navy initiated programs designed to remediate deficiencies in academic skills among selected personnel as early as the World War II time period. The first official policy on remedial training in basic skills established with a policy statement issued by the Secretary of the Navy on 2 June 1978 stated: "It is the policy of the Department of the Navy to provide, when indicated, on-duty remedial job-relevant basic skills training in order to fill personnel requirements" (SECNAVINST 1510.3, 1978, p. 1). [Job-relevant basic skills are defined as "those capabilities prerequisite to efficient completion of Navy training programs, adequate job performance and career advancement. Notable among these are literacy, study and computational skills" (p. 1).] In addition to new programs being developed as a result of the policy statement, fundamental skills training programs that were already operational were given official recognition by the Department of the Navy. One operational program, Academic Remedial Training (ART), provides instruction for recruits in basic reading and study skills as well as verbal skills needed to complete the demanding academic requirements of recruit training.

In 1967, the ART Program was initiated officially by the Naval Technical Training Command at each of the Navy's three Recruit Training Centers as a remedial reading course. The courses at the three sites utilized different curricula and testing plans due to the autonomy permitted in course development. Eventually, the Chief of Naval Technical Training recognized a need for a standardized curriculum and testing plan. The prescribed curriculum and testing procedures were implemented in 1978 (CNTECHTRAINST 1540.42). The scope of the curriculum included both reading and study skills (Chief of Naval Technical Training, 1978; Chief of Naval Technical Training, 1979; Bowman, Kaiser, Jones, & Petry, 1984). A verbal skills curriculum that focuses on

listening and speaking skills, primarily for recruits whose native language is not English, was added to the program at the Orlando and San Diego Recruit Training Centers in 1981 and the Great Lakes Recruit Training Center in 1985 (Chief of Naval Technical Training, 1980; Bowman, Kaiser, & Sherman, 1986).

The commitment of the Navy to provide fundamental skills training for enlisted personnel was reiterated through a policy statement by the Chief of Naval Operations in 1982. Specific skills identified for remediation were reading, mathematics, and communication skills (OPNAVINST 1510.11, 1982, p. 1). The policy states also that "A major goal of enlisted fundamental skills training is to achieve a minimum reading competency of the ninth grade" (p. 1).

Historically, the singular purpose of ART has been to assist recruits in acquiring the language skills required to complete recruit training successfully. While the ultimate purpose remains the same, the addition of the verbal skills component to the program expanded the scope of remediation to include listening and speaking skills of recruits who are primarily speakers of English as a second language. The population served by the program has been delimited to enlisted personnel who have not begun recruit training or have encountered academic difficulty after beginning recruit training.

The implementation of the standardized ART reading curriculum required the use of a Computer-Managed Instruction (CMI) system to perform test scoring functions. The CMI system is utilized to score the screening, diagnostic, and criterion tests employed in the program. A product of using the CMI system for test scoring is a database on the reading comprehension skill levels and educationally related characteristics of all Navy recruits. In addition, data on skill deficiencies and criterion test performance of ART students are available from computer records. Monthly reports on the educational, aptitudinal, and reading characteristics of all recruits who begin training

are routinely prepared and distributed to ART Program management personnel.

Problem

The problem defined for this study was to investigate the reading comprehension and educationally related characteristics and relationships among selected variables that describe the Navy's recruit population. The recruits who entered the Navy between June, 1985, and May, 1986, were the subjects who provided the data to address the problem. The variable of primary interest was the recruit's grade level score on reading comprehension. Other variables employed in the study were years of education, aptitude score, high school graduation status, and month of entry into the Navy.

Hypotheses

After performing descriptive analyses of the data on selected variables, six null hypotheses were tested statistically to identify differences among recruits on particular variables. The hypotheses tested were the following:

1. There are no differences in the distributions of recruits classified by reading grade level (RGL) category and month of entry into the Navy.
2. There is no difference in the distributions of recruits classified by high school graduation status and month of entry into the Navy.
3. There is no difference in the distributions of high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy.
4. There is no difference in the distributions of non-high school graduate recruits classifed by the 6.0 RGL criterion and month of entry into the Navy.
5. There is no difference in the distributions of recruits scoring below

the 6.0 RGL criterion classified by high school graduation status and month of entry into the Navy.

6. There is no difference in the proportions of high school graduate and non-high school graduate recruits who score below the 6.0 RGL criterion.

The .05 level of significance was used in testing the hypotheses.

The significance of the study is based on two considerations. First, the analyses could identify factors on which the recruit population varies across a 12-month period. Such information would be useful to ART Program management personnel in planning for the allocation and utilization of resources (e.g. staff, facilities, and instructional materials) more efficiently. In particular, variability in the numbers of recruits who need reading remediation in language skills would have a direct effect on the requirements for staffing and instructional materials. Second, this study could demonstrate the desirability of using CMI system data to monitor and manage the ART Program. Since these data are reported routinely to program management personnel, the data are readily available to use in making decisions regarding program needs and operations.

Related Research

Many research studies have been conducted on the reading skill levels of Navy enlisted personnel and training materials because of the importance of reading skills for success in training and job performance. Hoiberg, Hysham, and Berry (1974) reported a significant relationship between reading skills and successful completion of the first enlistment term in the Navy. Biersner (1975) found that many Navy training manuals are written at the 12th grade reading ability level or higher. Zierdt (1976) and Sticht (1982) concluded that the reading abilities of many recruits do not meet the skill requirements

of widely used Navy materials.

Several studies have described the reading skill levels of the Navy recruit population based on the Gates-MacGinitie Reading Tests. Duffy and Nugent (1978) found a median RGL of 11.9 on comprehension as a result of testing 31,575 recruits at the Recruit Training Center in San Diego between May, 1974, and May, 1975. The data showed that 2.8% of the recruits scored below the 4.0 RGL and 9.6% scored below the 6.0 RGL. They concluded that the reading skill levels of many recruits are well below the readability levels of the print materials used in recruit training and daily job tasks.

Bowman and Kerr (1979) reported that a sample of 14,503 recruits tested in the first few months of 1979 had a median RGL of 11.0 on comprehension while 1.1% scored below the 4.0 RGL and 5.2% scored below the 6.0 RGL. In a one-year study (1981), they found that 79,350 recruits who entered the Navy between June, 1980, and May, 1981, had a median RGL of 11.0 on comprehension with .7% scoring below the 4.0 RGL and 4.3% scoring below the 6.0 RGL. In a subsequent study (1982) based on 84,123 recruits who entered the Navy between June, 1981, and May, 1982, they reported a median RGL of 11.2 while .5% scored below the 4.0 RGL and 3.6% scored below the 6.0 RGL. They found in a more recent study (1983) on 77,347 recruits who entered the Navy between June, 1982, and May, 1983, that the median RGL was 11.4 with .9% scoring below the 4.0 RGL and 3.8% scoring below the 6.0 RGL. Kerr, Bowman, and Darcy (1984) indicated in a study on 67,740 recruits who entered the Navy between June, 1983, and May, 1984, that the median RGL was 12.1 with .7% scoring below the 4.0 RGL and 2.9% scoring below the 6.0 RGL. In a more recent study by Bowman and Kerr (1985), the data on 77,674 recruits who entered the Navy between June, 1984, and May, 1985, revealed a median RGL of 12.0 with .7% of the recruits scoring below the 4.0 RGL and 3.0% scoring below the 6.0 RGL.

The research studies indicate that reading skills are strongly related to the success of Navy enlisted personnel while the readability levels of many training and job materials are very demanding with respect to the skill levels required for their use. Descriptive research data reveal that the reading comprehension levels of recruits declined between 1974-75 and 1979. Later studies suggest that the median reading comprehension level of recruits has increased after a brief period of stability at approximately the 11th grade level.

Procedures

The data utilized in this study were obtained from the monthly CMI reports on Navy recruit characteristics and test performance. Data were available on 82,531 recruits who entered the Navy between June, 1985, and May, 1986. The reports provided data on four variables used in this study: years of education, high school graduation status, aptitude test scores, and reading comprehension grade level scores. A fifth variable, month of entry into the Navy, was defined by the month for which each report was prepared.

The Gates-MacGinitie Reading Comprehension Test (1978), hereafter called the Gates, and the Armed Services Vocational Aptitude Battery (1967-84) are the two tests for which data were reported. The Gates, Levels D, E, or F, is utilized as a screening test for all recruits who enter the Navy. An algorithm is used with the paragraph comprehension and verbal expression scores for the Armed Services Vocational Aptitude Battery to estimate the reading skill level of each recruit and to assign the appropriate level of the Gates. During the time period covered by this study, the recruits who scored below the 6.0 RGL on the first administration of the Gates were retested with an alternate form of Level D. (The data from the first administration of the Gates are used in this study.) Recruits who scored below the 6.0 RGL on the

second administration of the Gates were assigned to ART. (Recruits may also be assigned to ART if they encounter academic difficulties during recruit training.) The 6.0 RGL is not included as a possible score on the test norms.

The Armed Services Vocational Aptitude Battery (ASVAB) is administered to all recruits before they enlist in the Navy. The recruits included in this study had taken one of three series of ASVAB tests: Series 5-7, Series 8-10, or Series 11-14. The aptitude score used in the study was the Armed Forces Qualification Test (AFQT) score. The AFQT is a normative percentile score that is derived from a composite of selected ASVAB scores.

The monthly CMI reports provided means for years of education, AFQT scores of recruits classified by the 6.0 RGL criterion (above or below), and RGL scores. The median was calculated for RGL scores by month. Frequency distributions were compiled and percentage distributions were computed for all recruits on RGL categories, high school graduation status, and combinations of the variables on high school graduation status and the 6.0 RGL criterion. Proportions were calculated for high school graduate and non-high school graduate recruits who scored below the 6.0 RGL criterion.

A tabular format was used to present the means and medians as descriptive statistics. The Chi-square technique and confidence limits for differences in proportions were employed for the analyses related to testing the hypotheses. The Chi-square procedure provided comparisons of frequency distributions for RGL scores, high school graduation status, and the 6.0 RGL criterion and high school graduation status by month of entry into the Navy. Confidence interval limits were computed to compare the proportions of high school graduates and non-high school graduates who scored below the 6.0 RGL by month and composite group.

Results

The results of the study are reported in a series of nine tables. The descriptive data are depicted in the first three tables. The remainder of the tables present the data and results of the inferential analyses related to the hypotheses.

Descriptive Data

Table 1 contains the means on years of education by month of entry into the Navy for the recruits. The composite mean for the one-year time period was 11.8 years of education. The monthly means varied by only two months from 11.7 to 11.9 years. Means of 11.7 years occurred for six months--November, 1985, through April, 1986.

The means presented in Table 2 are derived from the AFQT percentile scores of recruits classified by the 6.0 RGL criterion and month of entry into the Navy. The composite means were 39.8 for all recruits who scored below the 6.0 RGL and 57.0 for all recruits who scored above the 6.0 RGL. Among the recruits with RGL scores below 6.0, the monthly means ranged from 36.6 in July, 1985, to 48.8 in April, 1986. Among the recruits with RGL scores above 6.0, the monthly means varied from a low of 55.8 in July, 1985, and March, 1986, to a high of 58.9 in May, 1986. The differences in the means for the low and high RGL groups were about 17 percentile points for the composite means and ranged from almost 9 to 20 points by month. The differences between the low and high RGL groups were somewhat variable during the 12-month period.

The medians and means for RGL of recruits by month of entry into the Navy are reported in Table 3. The median for the composite group was 11.9 RGL while the mean was 9.9 RGL. The monthly medians ranged from 11.5 RGL in March, 1986, to 12.0 RGL in five months throughout the 12 months. The means by month varied from a low of 9.7 RGL in March and April, 1986, to a high of 10.0 RGL in June

TABLE 1

MEANS ON YEARS OF EDUCATION FOR RECRUITS BY MONTH OF ENTRY

Month	N	Mean
June, 1985	8,238	11.8
July, 1985	9,268	11.9
August, 1985	7,286	11.9
September, 1985	7,663	11.9
October, 1985	6,537	11.8
November, 1985	6,040	11.7
December, 1985	5,557	11.7
January, 1986	7,596	11.7
February, 1986	6,472	11.7
March, 1986	6,698	11.7
April, 1986	5,482	11.7
May, 1986	5,694	11.8
TOTAL	82,531	11.8

TABLE 2

MEANS ON THE ARMED FORCES QUALIFICATION TEST SCORES FOR RECRUITS
BY SIXTH READING GRADE LEVEL CRITERION AND MONTH OF ENTRY

Month	Reading Grade Level Criterion			
	Below 6.0		Above 6.0	
	N	Mean	N	Mean
June, 1985	209	38.8	8,029	58.0
July, 1985	238	36.6	9,030	55.8
August, 1985	143	39.0	7,143	57.2
September, 1985	172	37.5	7,491	56.9
October, 1985	165	36.7	6,372	56.5
November, 1985	171	39.2	5,869	56.3
December, 1985	165	39.5	5,392	57.3
January, 1986	238	38.3	7,358	57.4
February, 1986	182	41.0	6,290	56.7
March, 1986	233	40.8	6,465	55.8
April, 1986	239	48.8	5,243	57.4
May, 1986	197	38.9	5,497	58.9
TOTAL	2,352	39.8	80,179	57.0

TABLE 3

MEDIANS AND MEANS ON READING GRADE LEVEL FOR RECRUITS
BY MONTH OF ENTRY

Month	N	Median	Mean
June, 1985	8,238	12.0	10.0
July, 1985	9,268	11.9	9.9
August, 1985	7,286	12.0	10.0
September, 1985	7,663	11.9	9.9
October, 1985	6,537	12.0	9.9
November, 1985	6,040	12.0	9.9
December, 1985	5,557	12.0	9.9
January, 1986	7,596	11.9	9.9
February, 1986	6,472	11.9	9.8
March, 1986	6,698	11.5	9.7
April, 1986	5,482	11.9	9.7
May, 1986	5,694	11.9	9.8
TOTAL	82,531	11.9	9.9

and August, 1985. The monthly medians and means did not reveal appreciable variability during the one-year time period.

Hypothesis 1

There are no differences in the distributions of recruits classified by RGL category and month of entry into the Navy. Table 4 presents the frequency and percentage distributions of recruits by RGL category and month of entry. The data on the composite group for the one-year period showed that 2.85% of the recruits had scores below the 6.0 RGL criterion--the criterion for mandatory referral to ART during this time period. The percentage of recruits who scored below the 6.0 RGL varied considerably among the 12 months as evidenced by a range from 1.97% in August, 1985, to 4.36% in April, 1986. The percentage of recruits who scored at or below the 8.0 RGL was 13.48% for the year with a monthly low of 11.87% in August, 1985, and a monthly high of 15.81% in March, 1986. For the composite group, 16.40% of the recruits were in the 8.1-10.0 RGL category and 25.46% were in the 10.1-12.0 RGL category. The monthly percentages varied less than 2% for each of the RGL categories. Although 44.66% of the composite group had RGL scores above 12.0, the monthly percentages ranged from 41.74% in March, 1986, to 46.37% in June, 1985. The Chi-square comparison of the RGL distributions of recruits by month of entry revealed significant differences across the 12 months, thereby leading to rejection of the null hypothesis tested at the .05 level of significance.

Hypothesis 2

There is no difference in the distributions of recruits classified by high school graduation status and month of entry into the Navy. The frequency and percentage distributions of recruits classified by high school graduation status are reported in Table 5. The data revealed that about 83% of the

TABLE 4

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF RECRUITS
BY READING GRADE LEVEL AND MONTH OF ENTRY

Month	Reading Grade Level Category												
	Below 4.0		4.0-6.0		6.1-8.0		8.1-10.0		10.1-12.0		above 12.0		Total
	f	%	f	%	f	%	f	%	f	%	f	%	f
June, 1985	44	.53	165	2.00	788	9.57	1,322	16.05	2,099	25.48	3,820	46.37	8,238
July, 1985	52	.56	186	2.01	1,009	10.89	1,525	16.45	2,410	26.00	4,086	44.09	9,268
August, 1985	31	.43	112	1.54	721	9.90	1,190	16.33	1,914	26.27	3,318	45.54	7,286
September, 1985	33	.43	139	1.81	783	10.22	1,303	17.00	1,963	25.62	3,442	44.92	7,663
October, 1985	28	.43	137	2.10	734	11.23	1,061	16.23	1,624	24.84	2,953	45.17	6,537
November, 1985	42	.70	129	2.14	641	10.61	969	16.04	1,506	24.93	2,753	45.58	6,040
December, 1985	45	.81	120	2.16	555	9.99	911	16.39	1,368	24.62	2,558	46.03	5,557
January, 1986	58	.76	180	2.37	785	10.33	1,223	16.10	1,925	25.34	3,425	45.09	7,596
February, 1986	53	.82	129	1.99	718	11.09	1,109	17.14	1,673	25.85	2,790	43.11	6,472
March, 1986	54	.81	179	2.67	826	12.33	1,114	16.63	1,729	25.81	2,796	41.74	6,698
April, 1986	68	1.24	171	3.12	602	10.98	879	16.03	1,389	25.34	2,373	43.29	5,482
May, 1986	47	.83	150	2.63	614	10.78	929	16.32	1,412	24.80	2,542	44.64	5,694
TOTAL	555	.67	1,797	2.18	8,776	10.63	13,535	16.40	21,012	25.46	36,856	44.66	82,531

Chi-square = 198.171 (Chi-square = 73.31, df = 55, level of significance = .05)

TABLE 5

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF RECRUITS
BY HIGH SCHOOL GRADUATION STATUS AND MONTH OF ENTRY

	High School Graduate				
	Yes		No		Total
Month	f	%	f	%	f
June, 1985	6,486	78.75	1,750	21.25	8,236
July, 1985	8,312	89.69	955	10.31	9,267
August, 1985	6,623	90.91	662	9.09	7,285
September, 1985	6,992	91.26	670	8.74	7,662
October, 1985	5,589	85.50	948	14.50	6,537
November, 1985	4,868	80.61	1,171	19.39	6,039
December, 1985	4,364	78.53	1,193	21.47	5,557
January, 1986	6,116	80.53	1,479	19.47	7,595
February, 1986	5,102	78.83	1,370	21.17	6,472
March, 1986	5,139	76.74	1,558	23.26	6,697
April, 1986	4,223	77.05	1,258	22.95	5,481
May, 1986	4,533	79.61	1,161	20.39	5,694
TOTAL	68,347	82.82	14,175	17.18	82,522

Chi-square = 1,692.073 (Chi-square = 19.68, df = 11, level of significance = .05)

recruits were high school graduates. The percentages of high school graduates were relatively higher during July - October, 1985. The lowest percentages were in March and April, 1986. The comparison of the frequency distributions of recruits on high school graduation status by month of entry utilizing the Chi-square procedure indicated that the distributions differed very significantly at the .05 level of significance. Therefore, the null hypothesis of no difference in the distributions was rejected.

Hypothesis 3

There is no difference in the distributions of high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy. Table 6 contains the frequency and percentage distributions of high school graduate recruits by the 6.0 RGL criterion and month of entry. The data for the composite group indicated that 2.90% of the high school graduate recruits scored below the 6.0 RGL on comprehension. The monthly percentages varied from a low of 1.99% in August, 1985, to a high of 4.50% in April, 1986. While higher percentages tended to occur in the latter months, a consistent pattern is not evident among the monthly percentages for the 12-month period. The results of the Chi-square comparison of the frequency distributions for high school graduate recruits by the 6.0 RGL criterion and month of entry showed that they differed significantly at the .05 level of significance. Consequently, the null hypothesis of no difference in the distributions was rejected.

Hypothesis 4

There is no difference in the distributions of non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry into the Navy. The frequency and percentage distributions of non-high school graduate recruits

TABLE 6

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF HIGH SCHOOL GRADUATE RECRUITS BY SIXTH READING GRADE LEVEL CRITERION AND MONTH OF ENTRY

	Reading Grade Level Criterion				
	Below 6.0		Above 6.0		Total
Month	f	%	f	%	f
June, 1985	178	2.74	6,308	97.26	6,486
July, 1985	222	2.67	8,090	97.33	8,312
August, 1985	132	1.99	6,491	98.01	6,623
September, 1985	155	2.22	6,837	97.78	6,992
October, 1985	147	2.63	5,442	97.37	5,589
November, 1985	146	3.00	4,722	97.00	4,868
December, 1985	132	3.02	4,232	96.98	4,364
January, 1986	189	3.09	5,927	96.91	6,116
February, 1986	144	2.82	4,958	97.08	5,102
March, 1986	181	3.52	4,958	96.48	5,139
April, 1986	190	4.50	4,033	95.50	4,223
May, 1986	163	3.60	4,370	96.40	4,533
TOTAL	1,979	2.90	66,368	97.10	68,347

Chi-square = 89.099 (Chi-square = 19.68, df = 11, level of significance = .05)

classified by the 6.0 RGL criterion and month of entry are depicted in Table 7. In the composite group, 2.62% of the recruits who were not high school graduates scored below the 6.0 RGL on comprehension. The monthly percentages varied from a low of 1.66% in August, 1985, to a high of 3.82% in April, 1986. The percentages were generally higher in the latter months of the 12 months. The Chi-square comparison of the frequency distributions of non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry revealed that they differed significantly at the .05 level of signficance. Thus, the null hypothesis that the distributions are not different was rejected.

Hypothesis 5

There is no difference in the distributions of recruits scoring below the 6.0 RGL criterion classified by high school graduation status and month of entry into the Navy. The frequency and percentage distributions are reported in Table 8 for the recruits who scored below the 6.0 RGL classified by high school graduation status and month of entry. The data showed that 84.18% of the recruits who obtained scores below the 6.0 RGL on comprehension were high school graduates. The monthly percentages ranged from 77.68% in March, 1986, to 93.28% in July, 1985. The percentages tended to be higher in the earlier months and lower in the latter months of the 12-month period. The comparison of the frequency distributions of recruits who scored below the 6.0 RGL classified by high school graduation status and month of entry using the Chi-square technique revealed that they differed significantly at the .05 level of significance. Therefore, the null hypothesis of no difference in the distributions was rejected.

Hypothesis 6

There is no difference in the proportions of high school graduate and

TABLE 7

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF NON-HIGH SCHOOL GRADUATE RECRUITS BY SIXTH GRADE LEVEL CRITERION AND MONTH OF ENTRY

	Reading Grade Level Criterion				
	Below 6.0		Above 6.0		Total
Month	f	%	f	%	f
June, 1985	31	1.77	1,719	98.23	1,750
July, 1985	16	1.68	939	98.32	955
August, 1985	11	1.66	651	98.34	662
September, 1985	17	2.54	653	97.46	670
October, 1985	18	1.90	930	98.10	948
November, 1985	25	2.18	1,146	97.82	1,171
December, 1985	33	2.77	1,160	97.23	1,193
January, 1986	49	3.31	1,430	96.69	1,479
February, 1986	38	2.77	1,332	97.23	1,370
March, 1986	52	3.34	1,506	96.66	1,558
April, 1986	48	3.82	1,210	96.18	1,258
May, 1986	34	2.93	1,127	97.07	1,161
TOTAL	372	2.62	13,803	97.38	14,175

Chi-square = 27.311 (Chi-square = 19.68, df = 11, level of significance = .05)

TABLE 8

FREQUENCY AND PERCENTAGE DISTRIBUTIONS OF RECRUITS SCORING BELOW SIXTH READING GRADE LEVEL BY HIGH SCHOOL GRADUATION STATUS AND MONTH OF ENTRY

	High School Graduate				
	Yes		No		Total
Month	f	%	f	%	f
June, 1985	178	85.17	31	14.83	209
July, 1985	222	93.28	16	6.72	238
August, 1985	132	92.31	11	7.69	143
September, 1985	155	90.12	17	9.88	172
October, 1985	147	89.09	18	10.91	165
November, 1985	146	85.38	25	14.62	171
December, 1985	132	80.00	33	20.00	165
January, 1986	189	79.41	49	20.59	238
February, 1986	144	79.12	38	20.88	182
March, 1986	181	77.68	52	22.32	233
April, 1986	190	79.83	48	20.17	238
May, 1986	163	82.74	34	17.26	197
TOTAL	1,979	84.18	372	15.82	2,351

Chi-square = 50.461 (Chi-square = 19.68, df = 11, level of significance = .05)

non-high school graduate recruits who score below the 6.0 RGL criterion. Table 9 presents data on the proportions of recruits who scored below the 6.0 RGL classified by high school graduation status and month of entry into the Navy. The data on the proportions of recruits who scored below the 6.0 RGL are discussed above as percentages for high school graduates and non-high school graduates separately. (See Tables 6 and 7.) An inspection of the relative proportions of the two groups revealed that a slightly higher proportion (.0028) of the high school graduates than non-high school graduates obtained scores below the 6.0 RGL criterion for the one-year period. In 10 of the 12 months (except for September, 1985, and January, 1986), the high school graduates had the higher proportion. The confidence limits for the comparison of the difference in the proportions for the composite groups revealed that the overall proportions did not differ significantly at the .05 level of significance because the limits included 0 within the range. The differences were also non-significant for 9 of the 12 months. In the three months where significant diffferences were observed, the proportions were higher for the high school graduates than the corresponding proportions for the non-high school graduates for two months while the difference was reversed for the two groups in the third month. The results of comparing the proportions for the two composite groups required acceptance of the null hypothesis of no difference in the proportions at the .05 level of significance.

Conclusions

The Navy's recruit population is described in this study based on data for selected variables that apply to the recruits entering the Navy during a 12-month time period. The conclusions are derived from the descriptive analyses and the results of testing six hypotheses about specific variables.

With regard to years of education, the typical Navy recruit has completed

TABLE 9

COMPARISON OF PROPORTIONS OF RECRUITS SCORING BELOW SIXTH READING GRADE LEVEL BY HIGH SCHOOL GRADUATION STATUS AND MONTH OF ENTRY

	High School Graduate				Confidence Limits	
	Yes		No		.025 to	.975
Month	N	p	N	p		
June, 1985	6,486	.0274	1,750	.0177	.0010	.0097
July, 1985	8,312	.0267	955	.0168	.0011	.0187
August, 1985	6,623	.0199	662	.0166	-.0070	.0136
September, 1985	6,992	.0222	670	.0254	-.0156	-.0092
October, 1985	5,589	.0263	948	.0190	-.0023	.0169
November, 1985	4,868	.0300	1,171	.0218	-.0014	.0178
December, 1985	4,364	.0302	1,193	.0277	-.0081	.0131
January, 1986	6,116	.0309	1,479	.0331	-.0123	.0079
February, 1986	5,102	.0282	1,370	.0277	-.0093	.0103
March, 1986	5,139	.0352	1,558	.0334	-.0084	.0120
April, 1986	4,223	.0450	1,259	.0382	-.0055	.0191
May, 1986	4,533	.0360	1,161	.0293	-.0044	.0178
TOTAL	68,347	.0290	14,175	.0262	-.0001	.0057

slightly less than 12 years of education. Almost five sixths of the recruits are high school graduates. The inferential analysis on high school graduation status indicates that higher percentages of high school graduates are included among the recruits during some months than other months during the year.

The aptitude of recruits as reflected by means on the AFOT does not appear to vary in any consistent pattern among the recruits with RGL scores below 6.0 or the recruits with RGL scores above 6.0. The means indicate that recruits who score above the 6.0 criterion have greater aptitude than recruits who score below the 6.0 RGL criterion. The difference in the aptitude score means for the two groups suggests that they are dissimilar populations.

The reading comprehension means of recruits exhibit relative stability across the 12-month period, placing the composite group near the 10th grade level. The median for the year places the group near the 12th grade level. The median for the composite group shows a discontinuation of a previous trend toward higher comprehension levels among recruits as reported for four earlier 12-month periods (Bowman & Kerr, 1981; Bowman & Kerr, 1982; Bowman & Kerr, 1983; Kerr, Bowman, & Darcy, 1984) and possibly stablization as shown for the immediately preceding 12-month period (Bowman & Kerr, 1985).

The frequency distributions of recruits by RGL categories reveal differences in the composition of the recruit groups when considered by month of entry into the Navy. Separate analyses of the distributions of high school graduate and non-high school graduate recruits classified by the 6.0 RGL criterion and month of entry indicate that differences also exist across the 12-month period for both groups. Higher percentages of recruits in both groups tend to score below the 6.0 RGL in the latter months of the period.

Differences exist in the 12-month distributions of recruits who obtain RGL scores below 6.0 when classified by high school graduation status and month of

entry in the Navy. Higher percentages of the recruits who score below the 6.0 RGL are high school graduates in the earlier months of the period. A non-significant higher proportion of the composite group of high school graduate recruits score below the 6.0 RGL than is found in the composite group of non-high school graduate recruits.

The findings suggest that the recruit population remains relatively stable, showing only slight variability with regard to means on years of education, reading comprehension skills, and aptitude scores. Several variables reveal variability across the 12-month period. Factors for which distributions by month differ include RGL scores, high school graduation status, high school graduate and non-high school graduate recruits who score above and below the 6.0 RGL criterion, and high school graduation status of recruits who score below the 6.0 RGL.

This study indicates that the recruits who enter the Navy are likley to vary in different months of the year on some important factors. As a result, ART management personnel need to plan for adjustments in the requirements for resources as the recruit population changes throughout the year. By being aware of the variability in demands, more efficient allocation and utilization of the resources can be achieved for ART and the Recruit Training Centers. The study also demonstrates that information is available through the monthly CMI reports on Navy recruit characteristics to improve the effectiveness of program management. Consistent monitoring of these reports and basic analyses of the data would enable the staff to determine the changes occuring in the composition of the recruit population that affect the ART Program.

References

Biersner, R. J. (1975). Reading grade levels of Navy rate training manuals and nonresident career courses (CNET Report 2-75). Pensacola, FL: Chief of Naval Education and Training.

Bowman, H. L., Kaiser, R. A., Jones, P. L., & Petry, J. R . (1984). Literacy skills curriculum for Academic Remedial Training (1984). Millington, TN: Chief of Naval Technical Training.

Bowman, H. L., & Kerr, N. J. (1979). The development and installation of a reading program for Academic Remdial Training in the U.S. Navy: skill profiles of recruits. Paper presented at the Mid-South Educational Research Association Annual Meeting, Little Rock, AR.

Bowman, H. L., & Kerr, N. J. (1981). An investigation of U.S. Navy recruit characteristics on reading comprehension and related variables. Paper presented at the Mid-South Educational Research Association Annual Meeting, Lexington, KY.

Bowman, H. L., & Kerr, N. J. (1982). A descriptive study on the reading comprehension and related characteristics of U.S. Navy recruits: a twelve-month profile. Paper presented at the Mid-South Educational Research Association Annual Meeting, New Orleans, LA.

Bowman, H. L., & Kerr, N. J. (1983). Reading comprehension and related characteristics of U.S. Navy recruits: a twelve-month description. Paper presented at the Mid-South Educational Research Association Annual Meeting, Nashville, TN.

Bowman, H. L., & Kerr, N. J. (1985). Twelve-month profile of U.S. Navy recruits on reading comprehension and educationally related characteristics: June, 1984, to May, 1985. Paper presented at the Mid-South Educational Research Association Annual Meeting, Biloxi, MS.

Bowman, H. L., Kaiser, R. A., Jones, P. L., & Petry, J. R. (1984). Literacy skills curriculum for Academic Remedial Training (1984). Millington, TN: Chief of Naval Technical Training.

Bowman, H. L., Kaiser, R. A., & Sherman, N. J. (1986). Verbal skills curriculum for Academic Remedial Training (1986). Millington, TN: Chief of Naval Technical Training.

Chief of Naval Technical Training. (1978). Academic Remedial Training curriculum. Millington, TN: Chief of Naval Technical Training.

Chief of Naval Technical Training. (1979). Literacy skills curriculum for Academic Remedial Training. Millington, TN: Naval Technical Training Command.

Chief of Naval Technical Training. (1980). Verbal skills curriculum. Millington, TN: Chief of Naval Technical Training.

CNTECHTRAINST 1540.42. (1978). Academic remedial training (ART). Millington, TN: Chief of Naval Technical Training.

Duffy, T.M., & Nugent, W.A. (1978). Reading skill levels in the Navy (NPRDC Technical Report 78-19). San Diego: Navy Personnel Research and Development Center.

Hoiberg, A., Hysham, C. J., & Berry, N. H. (1974). Effectiveness of recruits assigned to Academic Remedial Training. Psychological Reports, 34, 1007-1014.

Kerr, N. J., Bowman, H. L., & Darcy, D. M. (1984). Reading comprehension and educationally related characteristics of U.S. Navy recruits: twelve-month profile from June, 1983, to May, 1984. Paper presented at the Mid-South Educational Research Association Meeting, New Orleans, LA.

MacGinitie, W. (1978). Gates-MacGinitie reading tests (2nd ed). Boston: Houghton-Mifflin Company.

OPNAVINST 1510.11. (1982). Enlisted fundamental skills training. Washington: Department of the Navy.

SECNAVINST 1510.3. (1978). Remedial training in basic skills. Washington: Department of the Navy.

Sticht, T. G. (1982). Basic skills in defense (Final Report 82-6). Alexandria, VA: Human Resources Research Organization.

United States Military Enlistment Processing Command. (1967-84). Armed services vocational aptitude battery (Series 5-14). Ft. Sheridan, IL: United States Military Enlisthment Processing Command.

Zierdt, L. E. (1976). Remedial reading programs for personnel entering the United States Navy. Research report submitted to Air War College, Air University, Maxwell Air Force Base, AL.